DOCUMENT RESUME

ED 082 676 HE 004 705

TITLE	Affiliated Medical School Program to Increase Health Manpower: Report of the Commission to Study the Advisability and Feasibility of Utilizing Certain Medical Facilities as an Affiliated Operation of the University of Virginia School of Medicine to The Governor and the General Assembly of Virginia.
INSTITUTION	Virginia State General Assembly, Richmond. Senate.
PUB DATE	69
NOTE	35p.; Senate Document No. 10
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Educational Facilities; Feasibility Studies; Health Needs; Health Personnel; *Higher Education; Manpower Needs; *Manpower Utilization; *Medical Schools; *Physicians; School Community Cooperation
IDENTIFIERS	*Virginia

ABSTRACT

This document presents the report of the Commission to Study the Advisability and Feasibility of Utilizing Certain Medical Facilities as an Affiliated Operation of the University of Virginia School of Medicine. Emphasis is placed on health manpower and physician needs, physician supply in Virginia, and increasing physician supply in Virginia. As a result of the study, four recommendations suggest: (1) Affiliated programs between the University of Virginia School of Medicine and Medical Center and certain other medical communities to increase health manpower and achieve other objectives are highly desirable and feasible, and further development and expansion of such programs should be undertaken immediately. (2) The University of Virginia School of Medicine should be provided faculty and administrative budgetary support in the coming biennium for the continued development and implementation of affiliated programs already initiated in Roanoke and Winchester. (3) More detailed planning for necessary curriculum changes, the inclusion of other communities, housing, communications, and other logistical problems related to affiliated programs should be specifically studied and planned by the Commission during the next biennium. (4) The University of Virginia School of Medicine and Medical Center should plan continually for future health manpower needs in the State and should prepare for their role in fulfilling these needs. (Author/MJM)

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AFFILIATED MEDICAL SCHOOL PROGRAM TO INCREASE HEALTH MANPOWER

REPORT OF THE COMMISSION TO STUDY THE ADVISABILITY AND FEASIBILITY OF UTILIZING CERTAIN MEDICAL FACILITIES AS AN AFFILIATED OPERATION OF THE UNIVERSITY OF VIRGINIA SCHOOL OF MEDICINE

To

THE GOVERNOR

And

THE GENERAL ASSEMBLY OF VIRGINIA

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Comprehensive Health Planning
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SENATE DOCUMENT NO. 10

COMMONWEALTH OF VIRGINIA
Department of Purchases and Supply
Richmond
1969

HE004705

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AFFILIATED MEDICAL SCHOOL PROGRAM TO INCREASE HEALTH MANPOWER

REPORT OF

THE COMMISSION TO STUDY THE ADVISABILITY AND FEASIBILITY OF UTILIZING CERTAIN MEDICAL FACILITIES AS AN AFFILIATED OPERATION OF THE UNVERSITY OF VIRGINIA SCHOOL OF MEDICINE

To: Honorable Mills E. Godwin, Jr., *Governor of Virginia*
and
The General Assembly of Virginia

The 1968 General Assembly of Virginia enacted Chapter 547, Acts of Assembly 1968, "to create a commission to study the advisability and feasibility of using certain medical facilities in Virginia for clinical instruction of medical students and for training of students in allied health fields." This Act reads as follows:

> Whereas, health manpower needs in this State and nationally are not being met adequately; and
>
> Whereas, a great portion of the extremely high cost of a medical education is related to the basic science education of medical students in their first two years; and
>
> Whereas, both State-supported medical schools are currently expanding their basic science capabilities considerably in terms of facilities and personnel as well as educational and research functions; and
>
> Whereas, Norfolk continues to work toward an independent medical school which will enhance medical education and high quality medical care in the Tidewater area; and
>
> Whereas, the western area does not have appropriate clinical training affiliations to fully utilize its medical resources and facilities; and
>
> Whereas, Roanoke is the major population, industrial, and medical center for western Virginia having two major community-type hospitals with a major veterans hospital within a short distance; and
>
> Whereas, it would seem desirable to further exploit these resources and to involve them in the health education potential of our State as well as to further utilize these facilities as a clinical center for the area; and
>
> Whereas, such a development could have a great impact upon health training and medical care in our State at minimal cost; now, therefore,
>
> Be it enacted by the General Assembly of Virginia:
>
> § 1. There is hereby created a Commission to study the advisability and feasibility of utilizing the medical facilities, resources and professional personnel of Roanoke and other communities in the western part of the State as an affiliated operation of the University of Virginia directed toward participation in the education of medical students in their clinical years, post graduate, residency training and continuing education, as well as training in the allied health professions.

§ 2. The Commission shall consist of eleven members; two of whom shall be appointed by the President of the Senate from the membership thereof; three of whom shall be appointed by the Speaker of the House of Delegates from the membership thereof; and six of whom shall be appointed by the Governor from the State at large. The members of the Commission shall receive no compensation for their services, but may be reimbursed for their necessary expenses incurred in attendance upon meetings of the Commission. The Commission may employ such consultant and secretarial services as may be necessary in the conduct of the study.

§ 3. The Commission shall complete its study and make its report to the Governor and the General Assembly of Virginia not later than November one, nineteen hundred sixty-nine. The Commission, from time to time and prior to such date, may submit such interim reports and recommendations to the Governor as it may deem expedient.

§ 4. The Commission is authorized to accept and expend funds, gifts, and grants from private and public sources, including federal grants or contracts, for the purpose of carrying out its study.

Pursuant to this Act, members of the Commission were appointed, who were: Honorable Willis M. Anderson, Roanoke; Dr. K. R. Crispell, Charlottesville; Dr. Charles L. Crockett, Jr., Roanoke; Honorable Russell L. Davis, Rocky Mount; William H. Flannagan, Roanoke; Honorable Kossen Gregory, Roanoke; Senator William B. Hopkins, Roanoke; Honorable Joseph P. Johnson, Jr., Abingdon; Senator J. Harry Michael, Jr., Charlottesville; Frederic W. Scott, North Garden; and John W. Williams, Charlottesville.

The first meeting of the Commission was held at the Roanoke Memorial Rehabilitation Center, August 7, 1968, at which Dr. Crockett was elected Chairman and Mr. Flannagan, Vice-Chairman. Subsequent meetings were held in Roanoke, Charlottesville and Richmond. A public hearing was also held in Roanoke. The Division of Statutory Research and Drafting acted as secretary to this Commission, Frank R. Dunham, representing it.

The Commission approached its assigned task by studying physician manpower needs nationally and in Virginia; the current status and future plans for student enrollment at the State's two medical schools; mechanisms for increasing the enrollment at the University of Virginia School of Medicine through affiliations with the Roanoke medical community; the criteria and sanctions necessary for such affiliations; the objectives of, and various benefits from, such affiliations; the nature and experience of affiliated programs in other states; and cost projections for the alternative of a completely new medical school fully financed by the State. From these studies the Commission reached its conclusions resulting in certain recommendations for action by the General Assembly and the University of Virginia School of Medicine.

RECOMMENDATIONS

As a result of its study, this Commission recommends:

(1) Affiliated programs between the University of Virginia School of Medicine and Medical Center and certain other medical communities to increase health manpower and achieve other objectives are highly desirable and feasible, and further development and expansion of such programs should be undertaken immediately.

(2) The University of Virginia School of Medicine should be provided faculty and administrative budgetary support in the coming biennium for the continued development and implementation of affiliated programs already initiated in Roanoke and Winchester.

(3) More detailed planning for necessary curriculum changes, the inclusion of other communities, housing, communications, and other logistical problems related to affiliated programs should be specifically studied and planned by this Commission during the next biennium. As a result this study should be continued and expert knowledge and assistance should be obtained at a cost not to exceed $50,000.

(4) The University of Virginia School of Medicine and Medical Center should plan continually for future health manpower needs in the State and their role in fulfilling these needs.

PURPOSE OF THE STUDY

There is general agreement that physician and other health professional manpower needs are not being met adequately in the nation or in Virginia. It is further recognized that the education of physicians is extremely time-consuming, expensive and complex, in that it involves programs in undergraduate education, basic science and clinical medical education, hospital graduate education and training, and continuing education. It has been the charge and purpose of this Commission to study the advisability and feasibility of economically increasing the physician output of the University of Virginia School of Medicine, one of the State's two medical schools, through affiliations with, and utilization of, certain existing medical facilities in Virginia in programs of medical education of high quality.

HEALTH MANPOWER AND PHYSICIAN NEEDS

The National Advisory Commission on Health Manpower in its report of November, 1967, stated "Present trends indicate that in the coming decade the growth of health services will far outpace the growth of population. At the same time the 'physician shortage' will in all probability continue to worsen." [1] This Commission further pointed out that most reports on health manpower have estimated the adequacy of future health care on the basis of predicted ratio of physicians to population, but the shortcomings of this approach are apparent when one considers the vast increase in *demand* for *health services.* Thus, from 1955 to 1965 although the population increased 17%, and the number of active physicians increased 22%, including a 12% increase in physicians in private practice, there was a rise of *81%*, in "physician directed" *services* and an increase in hospital services of *65%*, and it was predicted that this rapid expansion of health services could be expected to continue through 1975. To quote further, "The Commission believes that there is currently a shortage of physicians and that this shortage will worsen in relation to growing demand, despite the expected increase in the supply of physicians in the years ahead." [1]

In 1966 the Board of Trustees of the American Medical Association appointed a Committee on Health Manpower which reported in June of 1967 an increasingly "critical need for more physicians, for better distribution of physician resources and allied health personnel in all categories" and recommended expansion of existing medical schools as well as new institutions. Subsequently, a joint statement on health manpower was issued March 5, 1968, by the American Medical Association (A.M.A.) and the Association of American Medical Colleges (A.A.M.C.) in which the two emphasized "the urgent and critical need for more physicians" and declared "both Associations endorse the position that all medical schools should now accept as a goal expansion of their collective enrollments to a level that permits all qualified applicants to be admitted." The statement called for curricular innovations and "other changes in the educational programs which would shorten the time required for medical education and minimize the cost." [2]

The Association of American Medical Colleges in October, 1967, authorized a curriculum study which included a comprehensive survey of all American medical schools, and a five-day workshop, culminating in recommendations to the Executive Council and membership of the A.A.M.C. at its meeting in November, 1968, which received the enthusiastic endorsement of this organization. (See Appendix A).

The Health Manpower Commission recommended: (1) "The United States should produce a sufficient number of physicians to meet its needs; and further, it should assist other countries, particularly developing nations, to improve their systems of medical education and their levels of medical practice and public health. (2) The production of physicians should be increased beyond the presently planned levels by a substantial expansion in the capacity of existing medical schools, and by continued development of new schools. (3) Federal funds in support of capital or operating costs of education should be provided to a medical school in such a way that they create economic incentives for the schools to expand enrollment while improving its quality. Such incentives should be based on increases in the absolute numbers of medical students." [1]

From the data obtained, it is indicated that our permanent supply of physicians is presently augmented at the rate of 1,400 a year by foreign medical graduates who become licensed to practice, which is approximately *17% of our new licentiates*; and the total of foreign medical graduates, at the time of the report, was over 40,000, comprising some *14% of the active physicians in this country*.

PHYSICIAN SUPPLY IN VIRGINIA

The preceding information seems relevant since there is a considerable flow of health personnel from area to area in the United States, and obviously the total national picture has a considerable bearing on supply and demand and events in Virginia. Certainly with its sound economy, demand for health services in the State per capita should be at least as high as the national average, and *therefore the provision of such services is a necessary goal.*

Information concerning the supply of physicians in Virginia[5] comes from a recent study supported in part by a contract from the Office of Comprehensive Health Planning of the State Department of Health. For 1967 the study found 4,811 active physicians in Virginia representing about *104.5 physicians per 100,000 population.* This compares to the national average of 132 physicians per 100,000 and only 19 of the 50 states have fewer active physicians per 100,000.

According to the same study only 25% of the actively practicing physicians in the State are general practitioners, and among these there are more older physicians than the current rate of new physicians entering general practice in the State. Over 25% of the current supply of general practitioners will reach age 65 by 1972. This study further confirms the already generally accepted opinion that the rural areas are losing physicians at a faster rate than urban areas.

It is very difficult to make completely accurate projections concerning the needed supply of physicians for the next decade due to unknown demands for health services, the impact of such programs as Medicare and Medicaid, and the ever-increasing complexity of medical care with advancing technology. During the twenty years from 1945 to 1965 there were 128,782 graduates of medical schools in the United States.[6] During the same twenty-year period there were 1,281 graduates from the University of Virginia School of Medicine and 1,748 from the Medical College of Virginia, making a total of 3,028, slightly less than 3% of the national total. However, during this twenty-year period, the number

of graduates over the country has been increasing steadily with new schools and expanded facilities at existing schools, but there was no major expansion of basic science building facilities or the number of graduates from the two Virginia schools. It is estimated that the United States population will grow to 230,000,000 by 1975 with approximately 3% in the State of Virginia. Therefore, Virginia should produce at least 3% of the country's physician graduates annually, which it is now estimated will be between 11,000 and 12,000 by that time. During the past decade, 20.6% of our annual supply of new physicians in the State of Virginia has been supplied by graduates of foreign medical schools.[5] If, as suggested by the Health Manpower Commission, there is a cessation of this drain of foreign medical graduates from their own needy countries, a reduction in the flow of new physicians locating for practice in Virginia would result, and since our physician: population ratio is already 26% below the national average, ***a minimum goal of 350 to 400 physician graduates per year*** by 1975 will be needed to keep pace with Virginia's needs.

The projected plans of the State's two existing medical schools are that the Medical College of Virginia plans to accept 136 students in its *entering* classes beginning 1970[7] and with the completion of its long-awaited new basic science building, the University of Virginia School of Medicine hopes to accept a minimum of 114 medical students in its *entering* class of September, 1971, with the contingency that some additional resources for some parts of clinical training might be needed at affiliated institutions.[8] Thus, according to present plans the combined *entering* class of the two schools in 1971 would be 250, which with minimal attrition figures hopefully would result in *240* graduating physicians in 1975, a number obviously below the projected needs as indicated above.

To alleviate these needs, it is hoped to enter 168 students at the Medical College of Virginia in 1975, contingent upon the availability of additional resources.[7] The University of Virginia hopes to admit a minimum of 130 students by 1973, and quite possibly more by 1975, depending upon the availability of new facilities for ambulatory care and the availability of affiliated institutions.[8]

The State Council of Higher Education in 1964[9] stated "Virginia is maintaining its supply of physicians by relying on outside sources at a time when a population growth, existing shortages, and increased demand for medical care make it imperative that more physicians be graduated within the State." (See Appendix C)

The changing population trends, demands for health services, increasing complexity of medical care, constantly increasing health manpower and medical facility needs, curriculum needs, and the long twenty-year gap without medical school expansion in the State all indicate that the medical schools and other appropriate bodies should be encouraged in on-going planning for health needs.

INCREASING PHYSICIAN SUPPLY IN VIRGINIA

The above data would seem to indicate that there is a pressing need to sharply increase the number of physicians graduating from medical schools nationally and in Virginia as rapidly as possible. This Commission was created to study the advisability and feasibility of utilizing certain existing medical facilities in an affiliated program with the University of Virginia School of Medicine as one means of economically increasing the number of physicians that could be graduated from that institution, one of the State's two existing medical schools.

Presently, by tradition medical schools have had two major divisions: (A) the basic science division, and (B) the clinical division.

(A) The basic science division includes the Departments of Anatomy, Biochemistry, Physiology, Pharmacology, Pathology, Microbiology, and Laboratory

Medicine for the instruction of medical students and graduate students. Such departments require considerable capital outlay for the rather extensive and complex educational and laboratory facilities necessary for teaching and research. They are usually in separate geographic areas connected to clinical departments of a school of medicine. Medical students in the past have customarily spent their first two years in the basic sciences, and their final two years in clinical training. Recent changes in many medical schools have seen curriculums become more flexible so that the time devoted to basic science instruction has been reduced for many but not necessarily all students.

(B) The clinical division of a medical school includes the various departments of clinical medicine in the associated and affiliated hospitals related to a particular school of medicine. Included in the function of such departments are the clinical care of ambulatory out-patients, hospitalized patients, the clinical education and training of medical students, the graduate education and training of interns and residents, research in clinical problems of medicine, and, more recently, the study of improved methods of the provision of health care to the citizenry. This portion of the medical student's training in today's medical curriculum might be considered to occupy one-half to two-thirds of his over-all program.

In looking ahead to physician manpower needs in our State, the University of Virginia School of Medicine began planning for expansion in 1960. To accomplish any major expansion, a new medical education building for the basic science division was necessary. Planning funds were appropriated by the General Assembly in 1964 and capital outlay funds by the 1966 General Assembly. Delays in availability of federal funding and spiraling costs delayed the start of construction until March, 1969, with completion expected in September, 1971. At that time expansion of the school's entering class will be possible. Initial planning called for expansion to 104, but the school has already further extended these plans to accept 114.[8]

Referring to the November, 1968, recommendations adopted by the Association of American Medical Colleges, the first listed recommendation seems particularly pertinent to this Study. "Medical schools must increase their output of physicians. All schools should immediately increase the number of entering students, accelerating expansion by *redistributing* temporarily the *use of existing resources*. Only by increasing the number of students beginning the study of Medicine will there be a major and continuing increase in the number of physicians in practice. It is too late to depend on presently planned expansion and the development of new medical schools for an acceptable increase in the number of physicians entering the community during the next ten years. Only an *increase* in the program of planned *output* of *existing* and developing *medical schools* can increase the supply of physicians in the next decade."

This Commission finds that, in line with the aforementioned recommendation of the A.A.M.C. and recent curricular changes, the new medical education building, when completed at the University of Virginia School of Medicine, will provide physical facilities that would quite adequately permit the school to further expand its entering classes of medical students well beyond the initially planned 104. Such further expansion would need to be contingent upon two additional resources:

(1) Any increase in numbers of students would naturally require funding for appropriate faculty increases.

(2) The expansion to 104 entering students was projected on the basis of the currently existing clinical facilities and patient resources at the University of Virginia Medical Center. The latter has not changed appreciably in recent years, although long-range planning continues for clinical facilities' expansion and their form, function and magnitude. Therefore, for any *immediate* expan-

sion of class size beyond 104 it would appear that additional *affiliated clinical* facilities would be most advantageous, if not absolutely necessary. If such were successfully accomplished, it then could have a bearing on the type and function of future clinical facilities' expansion at the University of Virginia Medical Center. For example, further planning might indicate that some highly specialized care facility might better serve the referral and consultative needs of the citizenry than a next major addition to provide for more general hospital beds of the usual type. Such a concept, of course, touches on the all important role of regional and Statewide comprehensive health planning.

In considering the location of clinical facilities that might be utilized in such an affiliation, this Commission was directed "to study the advisability and feasibility of utilizing the medical facilities, resources, and professional personnel of Roanoke and other communities in the western part of the State as an affiliated operation of the University of Virginia."

EXISTING AFFILIATIONS BETWEEN THE UNIVERSITY OF VIRGINIA AND ROANOKE:

There has been a very successful affiliated residency training program in Orthopedics between the University of Virginia Medical Center and the Roanoke Memorial Hospital since 1958, and, in 1967, similar affiliations were developed by the departments of General Surgery and Urology, which also included the Veterans Hospital. In 1968 a similar affiliated program for the training of residents in Otolaryngology was initiated. Since 1967, discussions have also been under way between the departments of Pediatrics, Obstetrics, Community Medicine, and others. The Department of Neurology at the University of Virginia Medical Center has conducted a special Neurology and Seizure Clinic in Roanoke for serveral years and a new Congenital Heart Disease Clinic will be started at the Roanoke Memorial Hospital in November, 1969, under the direction of Dr. Martha Carpenter, Associate Professor of Pediatrics and Director of Pediatric Cardiology at the University of Virginia Medical Center. Medical students, in small numbers, have been serving clinical clerkships and externships in Roanoke since 1967. Several Roanoke physicians have faculty appointments at the University of Virginia School of Medicine. (See Appendix D)

GEOGRAPHIC PROXIMITY AND LOGISTICS:

Roanoke is approximately 110 miles from Charlottesville and, with the completion of portions of Interstate 64 now under construction, the travel time by car will be no more than two hours. There are also direct travel connections by train, bus and commercial airline. Experience with the already existing affiliated programs has indicated that this time and distance are very definitely within the realm of functional practicality. For the development of affiliated programs on a much larger scale, however, problems of student housing, transportation of students and faculty and communication linkage between the University of Virginia and affiliated institutions, should be studied and planned for in greater detail.

POTENTIAL MEDICAL RESOURCES IN ROANOKE FOR AFFILIATED EDUCATIONAL PROGRAMS:

Some of the factors prerequisite to the utilization of affiliated hospitals by the Unitversity of Virginia School of Medicine for medical education and training are their size, proper accreditation, numbers and types of patient flow, and cooperation of the medical staff, administrative and governing body. The prior existence of intern and residency training programs and an active interest in staff educational programs would also be highly desirable.

The two large, voluntary, community-type hospitals in Roanoke which are located within a mile of each other, and the Veterans Hospital fulfill these criteria.

The Roanoke Memorial Hospital, currently having 500 beds, will have 725 beds by 1970. The new Community Hospital of Roanoke Valley is a 400-bed institution. The Veterans Hospital has 1700 beds, approximately 250 of which are in the general medical and surgical category. There are approximately 225 physicians in the area. A Health Survey of the Community Survey Study Committee in 1967 stated that "the high proportion of well-qualified medical specialists is unusual and an indication of the attractiveness of the area and its facilities to physicians." (See Appendix E)

ACCEPTANCE BY ROANOKE MEDICAL COMMUNITY:

Obviously in considering such an affiliated program, not only must it have to be found feasible by various criteria, but would have to be desirable and acceptable both to the University of Virginia School of Medicine administration and faculty and the Roanoke medical community. At the first meeting of the Commission, it was agreed that individuals and representatives of other appropriate groups should be invited by the Chairman as indicated. Accordingly, the President of the Roanoke Academy of Medicine, Dr. John A. Martin, was invited to meetings of the Commission and was asked to request the Academy to send a designated liaison representative regularly, which the Academy did.

Subsequently, the Roanoke Academy of Medicine, the medical staffs of the Community Hospital of Roanoke Valley and the Roanoke Memorial Hospital, and the Director of the Veterans Hospital, and the Roanoke Valley Regional Health Services Planning Council all endorsed the affiliated programs.

OBJECTIVES AND BENEFITS OF AFFILIATED PROGRAMS:

The Commission's study indicates several potential benefits and objectives which would be realized from affiliated programs and these will be discussed below:

(1) The educational capabilities of the University of Virginia School of Medicine could be extended by taking advantage of existing clinical facilities and medical personnel, willing to contribute their time and talent in teaching, as opposed to the expense of an entirely new State supported medical school, constructed and fully financed by the State.

(2) Another major objective of such an affiliated program would be the provision of an opportunity for students to see the practice of medicine in a community setting, the spectrum of disease, types of patients, and their many socio-economic and family problems. Inherent in such an experience would be the opportunity to see the model of capable and dedicated physicians in private practice. Furthermore, this setting could offer excellent opportunities for education and training programs in family practice. The net effect of this community experience could influence many more young physicians to enter family practice in Virginia.

(3) The development of affiliated programs between medical school centers and community hospitals not only could have a great impact upon the quality and standards of patient care, but is of invaluable assistance to the development of more and stronger internship and residency training programs in community hospitals. Weiskotten, et al.,[10] in a study of medical graduates found that the place of residency training was the single most important factor in the determination of a physician's location for practice. Therefore, this Commission concurs with the earlier report of the State Council of Higher Education that "if Virginia is to retain its graduates and attract other graduates, there must be more attractive internships and residency programs in hospitals in Virginia." [9]

(4) This new type of close affiliation between a medical school and com-

munity medical facilities and their respective staffs could provide a greatly needed and unique opportunity to study and develop improvements in our methods of providing and delivering health care, including the effects of such programs as Medicaid and Medicare. The Universities and the communities could undoubtedly develop a much better mutual understanding and respect for the other's problems on a continuing basis.

(5) If such an affiliated program were available in Roanoke, it could have a very favorable influence upon continued development of medical facilities for patient care in this area of the State. This would be particularly desirable when one considers that patients from western Virginia are now much farther from medical centers than those in any other area of the State for specialized diagnosis and treatment. The same benefits would accrue to physicians, nurses, and others in the health sciences in western Virginia who are much farther away from the medical school centers for continuing education than those in eastern, central or northern Virginia. Approximately ¼ of the State's population, ¼ of the State's physicians, and over ⅓ of the hospitals in the State are closer to Roanoke than they are to the two existing medical school centers in Charlottesville and Richmond. Therefore, Roanoke and the large area of the State west of Charlottesville and Richmond is the largest geographic and population area without an existing medical school center, close proximity to one or planning and development for such.

STUDY OF OTHER AFFILIATED PROGRAMS:

As one of its first tasks the Commission felt it quite important to study and acquire information about affiliated programs in existence or in planning at medical schools in other states. It was thought important to have an early understanding of the problems as well as the potentialities, procedural ideas, contractural arrangements, logistics, mechanics and many other aspects of such a program. Ideally we wanted to find a program involving a state, and state-supported medical school, and a community comparable to our own, and such existed in our neighboring state of North Carolina. Therefore, Dr. Reece Berryhill, former Dean, and now Chairman of the Department of Community Medicine at the University of North Carolina School of Medicine, was invited to meet with the Commission early in this study. He expressed the opinion that their programs have been quite satisfactory and the proposed programs between Roanoke and the University of Virginia School of Medicine could be extremely successful. (See Appendix I)

Drs. Charles Crockett, Robert Keeley, Chief of Staff at the Community Hospital of Roanoke Valley, and Donald Barnes, member of the Roanoke Memorial Hospital committee for future planning, made a site visit in April, 1969.

The Chairman in February, 1969, met with Dr. George Lukemeyer, Associate Dean of the University of Indiana School of Medicine, Dr. Frank Bryan, Fort Wayne, Indiana, and Dr. Donald Olson of South Bend to obtain information about the Indiana Plan of affiliated teaching programs, which the Indiana state legislature supported with a 2.5 million dollar appropriation for the recent biennium. They reported great satisfaction with their program. (See Appendix I)

The Chairman also discussed new plans of the State of Illinois with Dr. William Grove, Dean of the University of Illinois College of Medicine, and Dr. Graham Vance, a member of their faculty, and reviewed their entire written proposal for curriculum change and medical school expansion. They are taking the approach of locating several clinical schools of medicine in Rockford, Peoria, and Carbondale wherein some students, after their basic science courses, would receive their last three years of medical education in any one of these clinical schools affiliated with hospitals in their respective communities. (See Appendix I)

The University of Michigan Medical School has developed an affiliation agreement with the Henry Ford Hospital in Detroit which will permit the school to expand its first year enrollment "by providing an additional clinical base for additional students." (See Appendix I)

The new University of Connecticut Medical School likewise plans to have faculty members and clinical affiliations in community hospitals and many other schools have programs which vary in their extent, type and degree of affiliation.

The University of Massachusetts is presently considering various methods of developing a new medical school. (See Appendix I)

OPERATION OF AN AFFILIATED PROGRAM:

The preceding portions of this report have dealt with the background of why such programs should be considered and medical school and local medical community mutual acceptance. We now discuss the actual role affiliated medical institutions and resources might play in programs of medical education.

The basic concept simply revolves around the utilization of existing resources. Thus, if the University of Virginia School of Medicine's basic science division has now developed an educational potentiality greater than that of the currently existing clinical facilities at the University of Virginia Medical Center, then the use of additional existing clinical facilities elsewhere seems logical and reasonable. Specifically, medical students would take all of their basic science courses at the University of Virginia. During their next two years of education in clinical medicine they might spend varying periods of time at one or more affiliated institutions. Some students might have no such rotations and others might spend as much as an entire year, or even more, depending upon their interests and ultimate career plans. For example, a third year student might receive equal amounts of his clinical experience at the University of Virginia and a community hospital and if he became interested in family practice might take most or all of his fourth year in the community setting.

In the affiliated hospitals, students would receive some of their instruction from interested and dedicated practicing physicians contributing varying amounts of time to the program. Complementing and supplementing their instruction would be a nucleus of full-time faculty members based in the affiliated institutions. Local participants would have faculty status and receive some remuneration for part-time effort. Educational programs would involve medical students, interns, residents, continuing education for practicing physicians, and other health professionals.

During the past three years the University of Virginia School of Medicine administration and faculty have been analyzing and evaluating problems of importance in the current and future teaching of medicine to students preparing for various types of medical practice. These problems have centered about the best methods of increasing the output of physicians, involvement of medical students in community medical practice, continuing education of practicing physicians and methods of keeping these physicians in closer contact with the medical schools, and systems of providing health care.

As a result the Medical School arrived at the concept of a "second faculty" based primarily in community hospitals, but maintaining close liaison with the University of Virginia School of Medicine and Medical Center. These faculty members would be drawn from a community after some years' experience as respected practitioners in their medical community, and with demonstrated interest in educational activities. They would then go to the University of Virginia School of Medicine for a year or more to work with the faculty, administration, and medical students in medical education. Following this, they would

return to the community from which they had come continuing in their faculty capacity, and also directing intern, residency, continuing education, and student programs in their local community hospital rather than returning primarily to private practice. These physicians would spend four to five days each month and one continuous five-week rotation at the University of Virginia School of Medicine teaching and working with the faculty and administration each year after returning to their community where they would serve as liaison between the community and the University of Virginia. Under such arrangements, there could be an interchange of interns, residents and medical students between the University of Virginia School of Medicine and community hospitals under the direction of the community-based faculty member and selected physicians in the community. This program started in 1966 when Dr. Charles L. Crockett, Jr., of Roanoke became Associate Professor of Internal Medicine and Assistant Dean for Continuing Education at the University of Virginia School of Medicine where he spent eighteen months and then returned to Roanoke. In 1968 Dr. John Hortenstine of Winchester became Associate Professor of Medicine at the University of Virginia School of Medicine and has not returned to the Winchester community. Satisfaction with this new educational approach to the University of Virginia administration and faculty, the community hospitals, and medical students involved has been most gratifying thus far and other communities have expressed an interest in participation and inclusion in the study and planning of this Commission.

Planning and development of several important facets of such programs should be in depth, and to meet the urgent health manpower needs already delineated as rapidly as possible, there should be funding. The present study Commission worked without an appropriation, but having reached the conclusions that affiliated programs are feasible and urgently needed, feels that their further development deserves full support.

Funds will be needed for planning of student living quarters, communications linkages such as television and computers, curriculum changes, the inclusion of other communities, and the technical expertise necessary thereto for optimal development of the program and a further report to the Governor and General Assembly in 1972. (See Appendix J)

Costs of Expanding Physician Manpower:

Concerning the question of whether affiliated programs are economically feasible, alternatives such as the costs of a completely new State-owned-and-supported medical school should be considered. Dr. Cheves Smythe,[11] Associate Director of the Association of American Medical Colleges, has analyzed the collective experiences and cost data from the 16 newest American medical schools authorized since 1960 and which since 1964 have either admitted or planned to admit medical students. He points out that "there are many variations among schools with regard to the items included in primary construction costs" but the study provides a comprehensive review of such costs. The *average* capital costs for the nine developing medical schools making little use of existing facilities were $44,393,000 at an average of $51.15 per square foot for a total cost of $546,000 per first-year M.D. candidate. The *range* was $24,941,000 for one school entering 64 students to $77,723,000 for another school entering 100 students. (See Appendix K)

Based on the experience of the schools under development, reasonable planning projections for a school enrolling 64 to 80 M.D. candidates per class are cited in the appendix. (See Appendix L) Of the basic capital outlay costs analyzed, they appear to be equally divided between the basic science and clinical facilities.

The average cost cited in Appendix L, $40,000,000 capital outlay for a class of 64 to 80 students, was derived from expenses incurred between 1960 and 1967. A conservative estimate of rising costs since that time would place that figure at $50,000,000 if one were to start *construction* now; and if *planning* were started now, by the time such construction would occur, the cost could be $60,000,000.[12]

In his conclusions, Dr. Smythe indicated that as of 1967, a school of 64 to 80 students per class would require a basic operating budget "in excess of $2 million a year as a planning target for those organizing new medical centers." This figure is, of course, inadequate at this time and will undoubtedly increase proportionately with other inflationary costs. If any state were to start planning now for a new school, by the time it could be operational, it would seem that a $3 million operating budget would be required to keep pace with the support provided other comparable state schools. (See Appendix M) Planning and other starting costs *prior* to major capital construction and the admission of the first medical students averaged an additional $1.5 million per school.

TIME:

Dr. Smythe's study further says, "Sponsors of new medical schools must plan to wait five years from authorization of a school to enrollment of a first class of students, to support a dean and his staff for almost four years before the first teaches; to wait nine years to graduate the first physician; and to see an average of twelve to fifteen years go by before the first graduates are actively involved in practice." [11]

In summary, it would seem that a completely new State-supported school for 64 to 80 entering students would entail a minimum of $60,000,000 in capital outlay, $3 million annual operating budget, and probably not enter its first physician graduates into practice until after 1980.

Conversely, proposed affiliated programs would not involve the construction of new basic science buildings or teaching hospitals, and there would be some considerable contribution of faculty and teaching time by physician participants in the communities involved.

The State Council of Higher Education's report[9] of 1964 concluded that "it is unlikely that there will be sufficient tax funds available for the construction and operation for a third State-supported school for medicine" and suggested that "the General Assembly should be encouraged to look with favor upon the proposed development of a new private four year medical school." (See Appendix C)

SUMMARY AND CONCLUSIONS OF STUDY COMMISSION REPORT

1. The National Advisory Commission on Health Manpower, the Association of American Medical Colleges (AAMC), and the American Medical Association (AMA) all agree that there is a severe medical manpower shortage culminating in a joint statement by the latter two groups that, "All medical schools should now accept as a goal expansion of their collective enrollments to a level that permits all qualified applicants to be admitted." The AAMC further stated that, "All schools should immediately increase the number of entering students accelerating expansion by redistributing temporarily the use of existing resources."

2. The latest available study for the year 1967 revealed that Virginia had 104.5 physicians per 100,000 population compared to the national average of 132 physicians per 100,000 with only 19 of the 50 states having fewer active physicians per 100,000 than Virginia. The study also showed that the state is losing general practitioners faster than it is other types of physicians, and that the rural areas are losing physicians at a faster rate than urban areas.

3. Studies indicate that Virginia should have a goal of 400 physician graduates per year by 1975. This Commission finds that current plans of the state's two existing medical schools, the Medical College of Virginia and the University of Virginia School of Medicine, would provide approximately 240 physician graduates by 1975. It is, therefore, imperative that we graduate more physicians in Virginia if we are to alleviate the state's shortage of physicians and keep it from becoming more critical.

4. The University of Virginia could increase the number of its physician graduates and trainees through the utilization of the medical facilities, resources, and professional personnel of other medical communities in affiliated programs involving medical students, graduate training, and continuing education of health professionals.

5. Because of geographic proximity, existing educational programs, excellent hospital facilities and professional personnel, and enthusiastic acceptance by institutions and physicians, several affiliated programs between the University of Virginia and the Roanoke medical community already are functioning quite effectively and several physicians in the area hold faculty appointments at the University of Virginia School of Medicine as participants in these programs which are coordinated through an Assistant Dean based in Roanoke. The Community Hospital of Roanoke Valley with 400 beds, the Roanoke Memorial Hospitals with 725 beds, as of 1970, and the Veterans Hospital with 250 general medical and surgical beds, meet appropriate criteria for affiliations. There has been enthusiastic acceptance of affiliated programs by the Roanoke Academy of Medicine, the three hospitals named above, the Roanoke Valley Regional Health Services Planning Council, and the University of Virginia School of Medicine Administration and Faculty. An affiliated program with Winchester has also been initiated.

6. The objectives and benefits of affiliated programs are: (a) an economical increase in the number of physicians for the State; (b) through having training in the community setting, more students could see family practice and perhaps be attracted to it; (c) affiliated programs could greatly strengthen internship and residency training programs and it has been shown that the place of the latter is a very important factor in the determination of the physician's location for practice; (d) affiliated programs would enhance opportunities for studying and improving our system of providing health care; (e) an affiliated program in the Roanoke area could have a favorable influence upon the development of facilities in that area of the State for specialized patient care and continuing education for health professionals.

7. Affiliated programs of various types are being approached enthusiastically in several other States, including North Carolina, Indiana, Illinois, Michigan and Connecticut.

8. As an alternative to increasing the number of physician graduates, a completely new State-supported and financed school for 64 to 80 entering students would entail, in all probability, a minimum of $60,000,000 in capital outlay, a $3,000,000 annual operating budget and probably not enter its first physician graduates into practice until after 1980. The State Council of Higher Education's report of 1964 had earlier concluded that "it is unlikely that there will be sufficient tax funds available for the construction and operation of a third State-supported school for medicine."

9. Under the affiliated program envisioned, the University of Virginia School of Medicine, with appropriate increases in faculty support, could increase its entering class about 20% in 1971, with subsequent increases up to 33% or even 50%. Following basic medical education there, some students would re-

ceive varying amounts of their clinical training in the latter two years of medical school in affiliated community hospitals. Instruction in the community setting would be provided both by practicing physician-faculty appointees, and a small nucleus of full-time faculty members based in the affiliated institutions.

10. This Commission's study and planning should be extended during the next biennium for more detailed development of the educational, training and curriculum opportunities in such affiliations, the possible inclusion of additional interested communities, and further analysis of the logistical, housing, and communication problems involved in such programs. Such study and planning will need financial support for administrative, consultative, clerical, faculty, travel and related services, up to $50,000.

ACKNOWLEDGEMENTS

The Commission wishes to express its appreciation to the many physicians in Roanoke and at the University of Virginia School of Medicine who so graciously and generously contributed their time, talent and knowledge to this study. Also, an expression of appreciation is given to the Roanoke Memorial Hospital for making facilities available for meetings of the Commission.

It might also be pointed out that *italics* has been used in numerous quoted passages, and in such pasages, the *italics* is the Commission's.

Respectfully submitted,

Charles L. Crockett, Jr., Chairman

William H. Flannagan, Vice-Chairman

Willis M. Anderson

K. R. Crispell

Russell L. Davis

Kossen Gregory

William B. Hopkins

Joseph P. Johnson, Jr.

J. Harry Michael, Jr.

Frederic W. Scott

John W. Williams

A BILL to continue the Commission to study the advisability and feasibility of utilizing certain medical facilities in Virginia for clinical instruction of medical students and for training of students in allied health fields and to appropriate funds to the Commission.

Whereas, the 1968 General Assembly of Virginia enacted Chapter 547 of the 1969 Acts of Assembly, which created a Commission to study the advisability and feasibility of utilizing certain medical facilities in Virginia for clinical instruction of medical students and for training of students in allied health fields; and

Whereas, this Commission in its report to the 1970 General Assembly stated inter alia that the use of affiliated programs between the University of Virginia School of Medicine and Medical Center and certain other medical communities to increase health manpower and achieve other objectives are highly desirable and feasible and further development and expansion of such programs should be undertaken immediately; and

Whereas, more detailed development of educational training and curriculum opportunities in such affiliations and further analysis of the logistical, housing and communication problems involved in such programs is essential; and

Whereas, the use of such affiliation programs would increase the number of graduates of the University of Virginia School of Medicine, thus making more physicians available in the State, at a minimal cost to the State; now, therefore,

Be it enacted by the General Assembly of Virginia:

1. § 1. The Commission to study the advisability and feasibility of utilizing the medical facilities, resources and professional personnel of Roanoke and other communities in the State as an affiliated operation of the University of Virginia School of Medicine and Medical Center is hereby continued with its present membership. Any vacancy occurring shall be filled by appointment of the Governor. The members of the Commission shall receive no compensation for their services, but may be reimbursed for their necessary travel expense in attending meetings of the Commission.

§ 2. The Commission may employ such expert and secretarial assistance as it may deem necessary to develop the educational training and curriculum opportunities in such affiliations, the possible inclusion of all interested communities, to analyze the logistical housing and communication problems involved in such programs, and to render it any other assistance, advice and information it may deem necessary. For this purpose, there is hereby appropriated from the contingent fund of the General Assembly a sum sufficient not to exceed fifty thousand dollars.

§ 3. The Commission shall complete this study and make its report to the Governor and the General Assembly of Virginia not later than November one, nineteen hundred seventy-one.

REFERENCES

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11. Smythe, Cheves McC., "Developing Medical Schools: An Interim Report," *The Journal of Medical Education*, Vol. 42, No. 11, November, 1967.
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APPENDIX A

PRINCIPAL RECOMMENDATIONS OF THE WORKSHOP ON MEDICAL SCHOOL CURRICULUM

The participants in the AAMC Workshop on Medical School Curriculum of September 18 through 22, 1968, urge the adoption of the following recommendations by the Executive Council and the Membership of the Association of American Medical Colleges. This proposal was enthusiastically adopted by the Association on October 20, 1968.

The over-riding recommendation of the Workshop is that medical schools must now actively revise the content and methods used in the total span of the education of the physician so that his professional competence will be most relevant to meeting the changing health needs of the people. This recommendation reflects the unique social purpose of a medical school which is the primary education of the physician. An academic medical center and a university medical faculty engage heavily in a variety of health-related educational programs, basic and clinical research, and a wide range of patient services that are all essential contributions to health; but these efforts are appropriately collateral to the fundamental obligation for the education of the physician.

RECOMMENDATIONS

1. Medical Schools must increase their output of physicians. All schools should immediately increase the number of entering students, accelerating expansion by redistributing temporarily the use of existing resources.

Only by increasing the number of students entering the study of medicine will there be a major and continuing increase in the number of physicians in practice. It is too late to depend on presently planned expansion and the development of new medical schools for an acceptable increase in number of physicians entering the community during the next ten years. Only an increase in the presently planned output of existing and developing medical schools can increase the supply of physicians in the next decade.

2. Medical schools must admit increased numbers of students from geographic areas, economic backgrounds and ethnic groups that are now inadequately represented.

The mal-distribution of physicians follows the pattern of mal-distribution of housing, education and community services. The distribution of origins of medical students reflects the geographic, economic and ethnic groups that are relatively affluent. The result is an unintended but highly effective discrimination against equal educational opportunities in medicine.

Although there is no guarantee that students from deprived backgrounds will return to them to practice and so improve the distribution of physician services, it is highly probable that students who do not come from these backgrounds will not enter them upon graduation from medical school. The most likely source of increased physicians for these deprived groups is to provide opportunity for medical education to members of these groups.

3. Medical schools must individualize the education of the physician to fit the students' varying rates of achievement, various educational backgrounds and differing career goals.

The concept of a standard medical school curriculum and a standardized graduate from medical school is archaic and wasteful. Students with widely varying rates of learning may all have a high capacity for professional responsi-

bility in medicine. Our present methods of measuring learning achievement of medical students place an unduly heavy value on a rapid rate of achievement in a rigidly fixed time rather than assessing capacity for high achievement over a variable time. It is urged that these rate-dependent methods be modified so that time becomes a less significant variable in evaluating achievement.

It is the obligation of every medical school to provide opportunities for medical students to become familiar with the broad range of career goals available in medicine. Medical faculties have long experience in providing these special opportunities for those interested in academic careers. This same kind of opportunity should be available for those looking forward to practicing as a primary physician or as a more limited specialist.

4. Medical school curricula should be developed by interdepartmental groups that include participation of students. Curricula should be ratified by the faculty as a body rather than by individual departments.

5. The medical schools must now assume a responsibility for education and research in the organization and delivery of health services.

Simply increasing the number of physicians will not relieve the impediments to optimum support of the health of the people. The organization of the manpower required to deliver health services is presently inefficient and many of the activities of the physician could be carried out by suitably trained assistants if they were available. The health care team is poorly defined and the opportunity for upward mobility within it is inadequate. The advantages and limitations of group practice have been only superficially studied.

Medical schools should explore the contribution they can make through continuing education to improving the distribution of physicians in areas that are now professionally isolated and relatively unattractive to recent graduates.

The development of teaching and research programs associated with clinical services to people who are geographically isolated and to people who make up our urban and rural poor should be undertaken by medical school faculties. Comprehensive continuing care clinics for designated segments of the population appropriate in size for teaching and research programs should be developed by each medical school faculty as a clinical base for research in the organization and delivery of health care.

The costs of medical care must be controlled if the present system is to retain its credibility. Research must be undertaken by medical schools to develop alternatives to hospitalization. The cost-benefit relationship of the physician's decisions must become a part of the evaluation of the appropriateness of those decisions in the educational programs of our medical schools.

The problem of maintaining quality and effectiveness of health services while developing more efficient organization, more general availability and more reasonable costs is one that will not be solved without the participation of the medical schools. Neither knowledge nor numbers will suffice if these problems in delivery of health service are not resolved.

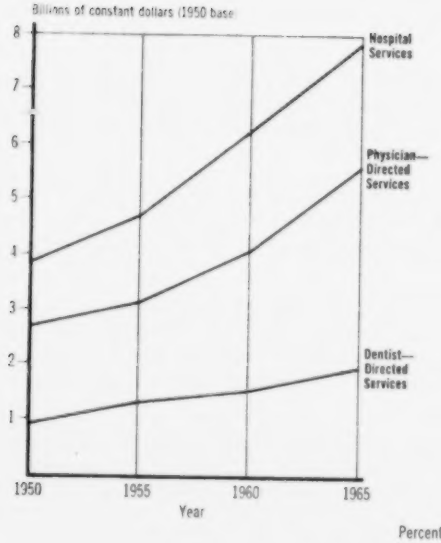
APPENDIX B

In commenting further on these recommendations, the Health Manpower Commission pointed out that if foreign medical graduates are phased out over a number of years, an eventual *expansion of 20%* of present enrollment at *United States medical schools* will be necessary to replace this specific source of manpower. It pointed out that changes in public policy, introduction of new programs, attempts to fill unmet health and educational needs and predictable

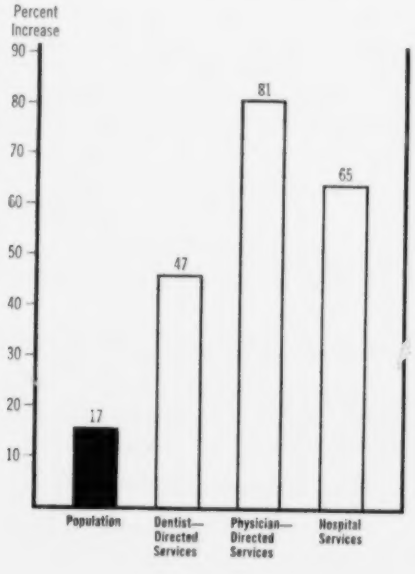
but undefined advances in research can all be expected to add substantially to the future requirements for physicians. If preliminary steps are taken now to expand medical school capacity throughout the first half of the 1970's, the full benefits of the expansion program will not be realized until 1979. It was further stated that, "At least initially, primary dependence must be placed upon expanding the capacity of existing medical schools. In contrast to the development of new schools, expansion can be accomplished quickly and economically. Many medical schools are now quite small, and the average graduating class is well under one hundred. Although faculties of medical schools often resist expansion because they believe it may lower the quality of education, a recent summary of available studies[3] shows that class size is unrelated to academic aptitude of students, achievement of National Board Examinations, attrition rates or ultimate career choices. We see few drawbacks to expansion, and great advantages in terms of saving time, reducing initial investment and overhead expense, and conserving teachers. New medical schools provide benefits to the community in which they are built above and beyond the education of new doctors. These benefits are important, and we urge continuation of legislative authority to assist in the construction of new schools. However, legislation arising from the need for more physicians should give *initial emphasis* to the *expansion of existing schools*." [1]

In the most recent projection of physician shortage and needs, Dr. Rashi Fein, an economist, estimates that the demand for physician services will grow 22-26% by 1975, and 35-50% by 1980, at the lower limit.[4] (See Appendix B)

The Health Manpower Commission further reported that of the 7,000 graduates of foreign medical schools who enter the United States each year, about 4,500 become interns or residents in hospitals with training programs approved by the American Medical Association and that many of the remaining 2,500 "receive training and provide care under poorly supervised conditions and programs that have not been approved." [1]



TRENDS IN THE PRODUCTION OF HEALTH SERVICES



PERCENTAGE INCREASES FROM 1955-1965 IN POPULATION AND HEALTH SERVICES

From "A Report of the National Advisory Commission on Health Manpower" Vol. 1, November, 1967, Page 11.)

APPENDIX C

Report of State Council of Higher Education to the Governor and General Assembly of Virginia, "Physicians for Virginia," Part I and Part II, 1964.

RECOMMENDATION PERTAINING TO THE GENERAL ASSEMBLY OF VIRGINIA:

1. The General Assembly should be encouraged to provide adequate support for the basic requirements for facilities and operating needs of both State medical schools.

2. The General Assembly should be encouraged to look with favor upon the proposed plans to increase the entering class of the Medical School at the Medical College of Virginia to 100 students during the coming biennium, and to provide the necessary funds to support this expansion.

3. The General Assembly should be encouraged to provide planning funds during the next biennium for the Medical School of the University of Virginia to study requirements for expanding the entering class of the Medical School to 100 students, effective about 1967.

4. The General Assembly should consider the problem of indigent patient care in hospitals throughout the state, and particularly in the teaching hospitals of the State medical schools to the end that a special study might be made on the matter of requiring all political units to undertake appropriate support for all indigent patients cared for by those hospitals.

5. The General Assembly should be encouraged to consider the necessity of establishing larger scholarship funds for the State medical schools to use in the encouragement and support of worthy Virginia students in the study of medicine.

6. The General Assembly should be encouraged to look with favor upon the proposed development of a new private, four-year medical school in Hampton Roads and provide every type of support to the project short of financial obligation in recognition that the construction and operation of such a school would make a substantial contribution to the State's increasing need for physicians.

APPENDIX D

ROANOKE MEMORIAL HOSPITAL STAFF HOLDING UNIVERSITY OF VIRGINIA FACULTY APPOINTMENTS.

DEPARTMENT OF MEDICINE—DEAN'S OFFICE:

Charles L. Crockett, Jr., M.D., Associate Professor of Internal Medicine and Assistant Dean for Continuing Education; also Medical Director, Roanoke Memorial Hospital.

H. C. Alexander, M.D., Clinical Instructor in Medicine.

J. Hayden Hollingsworth, M.D., Clinical Assistant Professor of Medicine.

DEPARTMENT OF SURGERY:

William Burnett, M.D., Assistant Professor of Surgery and Chief of Medical Service, Veterans Hospital, Roanoke-Salem.

DEPARTMENT OF ORTHOPEDIC SURGERY:

Charles B. Bray, Jr., M.D., Clinical Assistant Professor.

Louis P. Ripley, M.D., Clinical Assistant Professor.

Lee W. Shaffer, M.D., Clinical Instructor.

Thomas E. Strong, M.D., Clinical Instructor.

Philip C. Trout, M.D., Clinical Assistant Professor.

DEPARTMENT OF UROLOGY:

W. W. S. Butler, III, M.D., Clinical Instructor.

Richard H. Lowe, Jr., M.D., Clinical Instructor.

APPENDIX E

HOSPITALS IN ROANOKE VALLEY PARTICIPATING IN AFFILIATED PROGRAM WITH UNIVERSITY OF VIRGINIA.

Community Hospital of Roanoke Valley—400 beds (constructed for 200 bed expansion if needed); 96% occupancy January, 1968 (only four months after opening). Outpatient facilities and very active emergency room. *Education and Training:* Internship; surgical residency; nursing, lab and x-ray technology schools. Dr. Charles Loftin, Director of Medical Education. Full-time Director to cover Emergency Room Services.

Roanoke Memorial Hospitals—500 beds, with 250 under construction, including complete outpatient facilities for the city's welfare patients, a psychiatric, crippled children's and rehabilitation units—19,500 admissions in 1967. (115% occupancy.) 50,000 clinic and emergency visits. *Education and Training:* Internship; family practice residency; surgical residency; orthopedic, otolaryngology, and urology residents rotate from University of Virginia; other affiliations under development; registered and licensed practical nursing schools; laboratory and x-ray technology schools, all approved. Dr. Charles L. Crockett, Jr., Director of Medical Education, and Assistant Dean for Continuing Education and Associate Professor of Internal Medicine at University of Virginia School of Medicine. Dr. R. Earle Clendy, Director of Cardiology; full-time four-man group of physicians in Emergency Room for patient care and teaching.

Veterans Hospital—1,800 bed neuropsychiatric hospital including 200 bed general medicine and surgery service—already cooperating in residency training. Dr. William Burnett, Chief of Surgery, is Assistant Professor of Surgery at the University of Virginia School of Medicine and directs the affiliated Surgery Residency program whereby there are three residents in rotation at all times from the University of Virginia Department of Surgery.

APPENDIX F

HISTORY OF ROANOKE MEDICAL COMMUNITY PARTICIPATION

Discussions were held with the Roanoke Academy of Medicine Areawide Planning Committee, the Chairman of the Medical Education Committee and the Medical Society of Virginia. Representatives of the Roanoke Valley Regional Health Services Planning Council also participated and other individuals where appropriate.

The Roanoke Academy of Medicine at its January, 1969, meeting endorsed the development of affiliated programs between the University of Virginia School

of Medicine and the hospitals and physicians in the Roanoke medical community, with more detailed discussion at a subsequent joint meeting in February, 1969.

The conclusions were reached that an affiliated educational program was feasible and desirable and it would be most needed in the departments of Medicine, Pediatrics, Surgery, and Family Medicine. It would be desirable in many other departments for student electives as might be added when desired.

Accordingly, the Commission Chairman then met with these respective departments at both the Roanoke Memorial Hospital and the Community Hospital of Roanoke Valley to discuss further details of the manner in which affiliated programs might function and particularly to develop guidelines for the appointment of full-time physicians in the respective departments who would also hold faculty appointments at the University of Virginia and be responsible jointly to the hospital and the medical school with remuneration from both sources.

Simultaneously with these discussions, questionnaires were sent to staff members of the Community Hospital of Roanoke Valley and the Roanoke Memorial Hospital concerning their approval of programs and their willingness to participate and teach. The response was overwhelmingly favorable. (See Appendix G)

The staffs of both of these institutions gave unanimous approval to the proposed affiliations, and subsequently the respective departments of Medicine, Pediatrics, and Surgery approved guidelines for full-time educational directors in their departments in both institutions.

At a public hearing held in Roanoke, August 27, 1969, Dr. Peter A. Wallenborn, Jr., President of the Roanoke Academy of Medicine, spoke on behalf of the Academy endorsing the proposal, as did Dr. Robert L. A. Keeley, Chief of Staff of the Community Hospital of Roanoke Valley, Dr. Edwin J. Palmer, Chief of Staff of the Roanoke Memorial Hospital, in absentia, and Dr. Thomas Stage, Director of the Veterans Hospital. Mr. John J. Butler, President of the Roanoke Valley Regional Health Services Planning Council, appeared on behalf of that body to express its support and endorsement of the proposal. (See Appendix H) Also, the Roanoke City Council endorsed the program by resolution.

ATTENDANCE AT SPECIAL JOINT MEETING--REPRESENTATIVES OF ROANOKE MEDICAL COMMUNITY, UNIVERSITY OF VIRGINIA FACULTY, AND STUDY COMMISSION–FEBRUARY 20, 1969.

STUDY COMMISSION:

Honorable Willis M. Anderson
Dr. Charles L. Crockett, Jr., M.D., Chairman
Honorable Russell L. Davis
Mr. Kossen Gregory
Honorable William R. Hopkins

UNIVERSITY OF VIRGINIA SCHOOL OF MEDICINE FACULTY:

Dr. Jay Y. Gillenwater, Chairman, Department of Urology.
Dr. John Hortenstine, Department of Medicine (Medical Director, Winchester Memorial Hospital)
Dr. T. R. Johns, Chairman, Department of Neurology.
Dr. Daniel Mohler, Acting Chairman, Department of Medicine.
Dr. W. H. Muller, Jr., Chairman, Department of Surgery.
Dr. Warren G. Stamp, Chairman, Department of Orthopedics.
Dr. David Smith, Chairman, Department of Pathology.
Dr. J. Edwin Wood, III, Associate Dean.

ROANOKE ACADEMY OF MEDICINE:

Dr. Charles B. Bray, Jr., Areawide Planning Committee.
Dr. John A. Martin, Liaison Representative.
Dr. Michael J. Moore, Areawide Planning Committee.
Dr. Louis P. Ripley, Chairman, Areawide Planning Committee.
Dr. Charles D. Smith, Areawide Planning Committee.
Dr. John T. Walke, Areawide Planning Committee.
Dr. Peter A. Wallenborn, Jr., President.

HOSPITAL REPRESENTATIVES:

Burrell Hospital:

Dr. F. W. Claytor, Medical Director.

Community Hospital of Roanoke Valley:

Dr. Richard R. Chamberlain, Chief of OB-GYN.
Dr. Francis M. Guilfoyle, Chief of Pediatrics.
Dr. Robert L. A. Keeley, Chief of Staff.
Mr. Thomas McCallie, Intern Administration.
Dr. Alexander McCausland, Board of Trustees. (Also Chairman, Medical Education Committee of Medical Society of Virginia.)
Dr. David P. Minichan, Surgery Department.
Mr. William Reid, Administrator.
Dr. James E. Wheless, Chief of Medicine.
Dr. John W. Yost, Chief of General Practice.

Gill ENT Hospital:

Dr. John W. Kolmer

Lewis-Gale Hospital:

Dr. Richard Newton
Dr. Frank A. Wade, Chief of Staff
Mr. David Williamson, Administrator

Roanoke Memorial Hospital:

Dr. Donald D. Barnes, Chairman, Future Medicine & Expansion Committee.
Dr. John O. Boyd, Jr., Chief of General Practice.
Mr. Paul N. Bridge, Associate Director.
Dr. Rufus P. Ellett, Jr., Chief of OB-GYN.
Dr. J. Edward George, Chief of Surgery.
Dr. R. Earle Glendy, Director of Cardiology.
Dr. Earl R. Johnson, Jr., Chief of Medicine.
Dr. Richard H. Lowe, Jr., Director, Urology Residency Training.
Dr. Edwin J. Palmer, Chief of Staff and Board of Trustees Member.
Dr. Edgar N. Weaver, Vice-Chief of Surgery.

Veterans Hospital:

Dr. A. K. Baur, Chief of Staff.
Dr. Walter Buckner, Chief of Medicine.
Dr. William Burnett, Chief of Surgery.
Dr. W. W. S. Butler, III, Director of Urology Residency Training.
Dr. Thomas Stage, Director.

OTHERS:

Dr. James Fagan, Roanoke Health Department.
Dr. Charles Lofton, Bowman-Gray School of Medicine.

APPENDIX G

QUESTIONNAIRE

TO BE RETURNED TO THE EXECUTIVE COMMITTEE OF THE PROFESSIONAL STAFF, ROANOKE MEMORIAL HOSPITAL.

1. Do you favor affiliations with the University of Virginia School of Medicine in the further development of educational programs for residents, interns, and medical students?
   YES_____ NO_____
2. I would like to participate in teaching programs for: RESIDENTS_____ INTERNS_____ STUDENTS_____
3. I am willing to devote approximately _____ hours per year to teaching. (It is estimated that attending physicians on pediatrics or medicine currently spend about 35-50 hours in a month on service, as an example.)
4. In general, I am willing to have my patients utilized in teaching programs, but with the understanding that I may designate certain patients as non-teaching admissions.
   YES_____ NO_____
5. Do you approve of full-time directors of training programs in certain specialties, *subject* to the approval of specific department concerned in our hospital?
   YES_____ NO_____
6. REMARKS:

_____
(Signature)

RESULTS OF QUESTIONNAIRE SENT TO STAFF OF ROANOKE MEMORIAL & COMMUNITY HOSPITAL

QUESTION 1: 115 yes 3 no

QUESTION 2: 83 residents 58 interns 81 students

QUESTION 3:
- 13 "under 35 hours"
- 4 35 hours
- 10 40 hours
- 14 50 hours
- 2 75 hours
- 15 100 hours
- 15 "as indicated"
- 13 (different answers; anywhere from 48 to 600 hours)
- 3 "no" hours
- 11 "?" hours

QUESTION 4: 115 yes 3 no

QUESTION 5: 105 yes 5 no

(Some physicians did not answer questions 2, 3 & 5.)

APPENDIX H

CONCERNING THE GOVERNOR'S STUDY COMMISSION FOR EXPANDING MEDICAL EDUCATION IN VIRGINIA

MEMBERS OF THE GOVERNOR'S STUDY COMMISSION, LADIES AND GENTLEMEN—

I speak as the representative of the Roanoke Valley Regional Health Services Planning Council which encompasses at present Roanoke County, Botetourt County, City of Roanoke, and City of Salem in its planning area. We wish to commend the efforts of the Study Commission during the past year in the matter of determining the feasibility of using Roanoke area medical facilities and medical professionals in providing clinical experience for third and fourth year medical students, graduate medical students, and allied health education endeavors of the University of Virginia.

The Health Planning Council is a broadly representative body in this area. Twelve of its members are consumers of health services with some of these consumers being representatives of the various local governments in the area. In addition, there are ten members who represent a broad range of providers of health services such as physicians, nurses, pharmacists, hospital administrators, public health officers and so forth. One of the main objectives of the Health Planning Council is to promote and encourage coordinated areawide health planning within a comprehensive framework to be developed by the Council. Specifically, we are concerned with a health planning process to assure adequate provision in our area of a variety of health facilities, health services, and health manpower.

Since the Study Commission is looking at the possibility of an increase in the number of physicians graduating from Virginia medical schools and a better distribution of those physicians in Virginia after graduation, their objective coincides with one of our objectives, which is adequate provision of health manpower.

As the life span of our people increases and as advancing technology eliminates the threat of death from diseases that affect all ages, we have a population that is growing at an alarmingly rapid rate. The expanding population requires a growing number of physicians and allied health professionals, and we are concerned that the rate of growth of additional physicians is not keeping pace with the growth of the general population.

Since primary consideration is being given to increasing the numbers of undergraduate medical students, it would seem to be a realistic proposal for the University of Virginia Medical School to accept more students for the first and second year basic science phase of their medical education. After this, some of the students would affiliate with Roanoke area hospitals and the broad complement of physician specialists of this area in the third and fourth years for their clinical experience. We submit that the end result of such an arrangement would be larger graduating classes of physicians (possibly as much as 25-30 percent larger), thus more available physicians for the provision of medical care in Virginia.

From a business standpoint, the cost of educating more physicians by using the facilities in a major population center such as the Roanoke area will most certainly prove to be the least expensive plan that could be devised, and certainly at far less cost than another medical school in the state! If the broad range of physician specialists and the hospitals in this area are willing to participate in the education of medical students in the practice of community medicine, then they should be given the opportunity to help increase the numbers of physicians in Virginia.

In consideration of these factors, the position of the Roanoke Valley Regional Health Services Planning Council is as follows:

1.) It commends the efforts of the Study Commission during the past year for determining that such a plan was feasible and advisable. Further, the Health Planning Council supports the aims and objectives of the Study Commission.

2.) It encourages the Governor and the General Assembly of Virginia to authorize continuation of this Commission's study and planning activities for at least two years with funding to allow for detailed development of plans and, hopefully, implementation by 1973.

For the Roanoke Valley Regional Health Services Planning Council:

JOHN J. BUTLER, *President*

October 15, 1969.

File # 137.

The Honorable Mills E. Godwin, Jr.
Governor of Virginia
Richmond, Virginia.

Dear Sir:

I am enclosing copy of Resolution No. 18922, endorsing a proposal to utilize Roanoke area medical facilities for the clinical experience of third and fourth year medical students and recommending continuance of the Governor's Study Commission created pursuant to Chapter 547 of the 1968 Acts of Assembly of Virginia for an additional two years, which Resolution was adopted by the Council of the City of Roanoke at its meeting on Monday, October 13, 1969.

Very truly yours,

VIRGINIA L. SHAW
City Clerk.

VLS:mp

Enc.

cc: The Honorable M. Caldwell Butler, Shenandoah Building, City.
The Honorable William B. Hopkins, Boxley Building, City.
The Honorable Willis M. Anderson, Shenandoah Building, City.
The Honorable Ray L. Garland, 3752 Sunrise Avenue, N.W., City.
Mr. Frank H. Mays, Executive Director, Roanoke Valley Regional Planning Council Health Services, P.O. Box 2721, City.
Dr. Charles L. Crockett, Jr., 3136 Somerset Avenue, S.W., City.
Mr. Hampton W. Thomas, Mountain Trust Building, City.

IN THE COUNCIL OF THE CITY OF ROANOKE, VIRGINIA,

The 13th day of October, 1969.

No. 18922.

A RESOLUTION endorsing a proposal to utilize Roanoke area medical facilities for the clinical experience of third and fourth year medical students; and recommending continuance of the Governor's Study Commission, created pursuant to Chapter 547 of the 1968 Acts of Assembly of Virginia.

WHEREAS, a Commission created by the General Assembly of Virginia to study the advisability and feasibility of utilizing the medical facilities, resources and professional personnel of Roanoke and other communities in the western part of the State as an affiliated operation of the University of Virginia, directed toward participation in the education of medical students in their clinical years, post graduate residency training and continuing education, as well as training in the allied health professions has had brought to its attention by members of

the Roanoke Academy of Medicine and by the Roanoke Valley Regional Health Services Planning Council this City's unusually fine resources of hospitals and professionally qualified physicians which, together, would lend themselves admirably to a program directed towards the clinical education of medical students and post graduate medical training and continuing education and

WHEREAS, it would appear that, while the efforts of the aforesaid Commission in discharging its duties and functions have been outstanding, more study will need to be made in order to work out difficult logistical problems attendant upon the proposal.

THEREFORE, BE IT RESOLVED by the Council of the City of Roanoke that this Council heartily commends the members of the Governor's Study Commission created by Chapter 547 of the 1968 Acts of Assembly of Virginia for the efforts and studies made by said Commission during the past year; and that this Council highly endorses the proposal made to the Commission that a plan be formulated and implemented which would utilize the medical facilities existing in the City of Roanoke, including its fine hospitals and reservoir of professionally qualified physicians in the clinical training of third and fourth year medical students in the University of Virginia, and in post graduate medical training and continuing education.

BE IT FURTHER RESOLVED that this Council recommends to the Governor of Virginia and to the 1970 General Assembly of Virginia that the Study Commission created by Chapter 547 of the 1968 Acts of said Assembly be continued for at least an additional two years, with adequate funding to permit for the development of detailed plans based upon the aforesaid proposal, and of early implementation of such plan.

BE IT FURTHER RESOLVED that the City Clerk do transmit attested copies hereof to the Honorable Mills E. Godwin, Jr., Governor of Virginia, and to representatives of the City of Roanoke at the 1970 Session of the General Assembly of Virginia.

ATTEST:

VIRGINIA L. SHAW
City Clerk

APPENDIX I

MEETING WITH DR. REECE BERRYHILL, CHAIRMAN, DEPARTMENT OF COMMUNITY MEDICINE, UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

Dr. Berryhill met with us on November 18, 1968, from 10:30 a.m. until 2:00 p.m. and traced the development and current status of their affiliated programs, along with their philosophy and objectives, in a most frank and informative manner. He indicated that medical schools are recognizing the need for certain community hospitals to participate in the education of medical students, interns, residents, and practicing physicians. He pointed out that such affiliations benefit the medical school by enabling it to train more physicians, and provide students with a better view of community medical practice. Such programs benefit the community by stimulating a high level of patient care and staff continuing education. The University of North Carolina has affiliated programs of various types with the Charlotte Memorial Hospital, the Wake County Hospital in Raleigh, and the Moses Cone Hospital in Greensboro. The former two, thus far, mainly include intern and residency programs, while the latter is a new program for medical students and includes the basing of faculty members in the Moses Cone Hospital.

INDIANA PLAN

2.5 million per biennium from State Legislature in 1967 to support:

1) Medical student electives in community hospitals
2) First year medical school courses at Indiana, Purdue and Notre Dame
3) Directors of Medical Education in community hospitals
4) Supplementation of intern and resident salaries in community hospitals
5) Television network between the University Medical Center at Indianapolis and certain communities.

ILLINOIS PLAN

Just starting. Students would take first year of medical school at University of Illinois College of Medicine (Chicago) or at the main university campus at Urbanna. Last three years at Chicago *or* at branch *clinical* schools in Rockford or Peoria. Similar to University of Virginia–Roanoke proposal, in that Rockford and Peoria are about the same size as Roanoke and same distance from the parent school in Chicago and plan just beginning with community hospital affiliations. There will be full-time faculty at these clinical schools.

Moves for Manpower

U. OF MICHIGAN AFFILIATES WITH HOSPITAL

Another step has been taken to increase the number of physicians in Michigan.

An affiliation agreement involving the U. of Michigan and Detroit's Henry Ford Hospital has been announced by Robben W. Fleming, university president, and Benson Ford, president of the hospital's board of trustees.

The agreement concluded months of discussion involving William N. Hubbard, Jr., MD, dean of the UM Medical School, and the medical and administrative leaders of the hospital. Dr. Hubbard hinted that such an affiliation was in the making in an interview feature on Michigan's medical manpower efforts in the Feb. 24, 1969, issue of *The AMA News*.

More Students: Dr. Hubbard said in the interview that the medical school would expand its first year entering enrollment from the present 205 to 300 students "as soon as possible." With the agreement announcement, he declared the affiliation would "bring this commitment one step nearer realization by providing an additional clinical base for additional students."

The hospital, founded by the automotive pioneer more than 50 years ago, is one of the largest in the United States. Its staff has received national recognition for excellence in comprehensive patient care and in post-graduate residency training programs.

While details of the agreement remain to be worked out, it is expected that UM medical students will take part of their clinical studies at the Henry Ford Hospital under tutelage of staff physicians there. Similar arrangements already exist with the Veterans Administration Hospital in Ann Arbor and the Wayne County General Hospital.

Faculty Appointment: In addition, the Henry Ford Hospital staff will have access to the university's medical center facilities and resources for use in programs in which they are cooperating. Where appropriate, Dr. Hubbard indicated, hospital physicians may be appointed to the UM clinical faculty.

Dr. Hubbard emphasized the affiliation does not alter the role of responsibility of either the hospital or the university. The hospital, he said, will remain re-

sponsible for patient care and the university will be responsible for academic programs.

(From the *A.M.A. News*, March 24, 1969)

BOSTON HERALD TRAVELER

5 CHOICES PROPOSED FOR MEDICAL SCHOOL

By JOHN M. LANGONE

HT Medical Editor

An MIT management expert has proposed five alternatives—including a novel system of community medical schools which would make primary use of existing educational and hospital facilities—in a bulky report on the University of Massachusetts Medical School.

The suggestions, which include proceeding with construction of the medical school and teaching hospital in Worcester, were included in a study prepared by Dr. Leon S. White, Sloan School of Management, and handed to Gov. Sargent yesterday.

The report, authorized by Donald R. Dwight, Commissioner of Finance and Administration, made no recommendations.

Instead, it left decisions as to what to do about the politically-explosive medical school to the governor, who will ask a panel of six experts—to be named Friday—for their recommendations.

Dwight told a news conference that the panel would represent a broad spectrum of medical expertise but that in order to assure objectivity none would be from Massachusetts.

"I would hope that we would have the panel's report within several weeks of its convening," Dwight said.

The White report—which last night drew the criticism of UMass Medical School Dean Lamar Soutter that "apparently some of the facts have been altered" —suggested these five alternatives:

• Proceed with construction of the school and the 400-bed teaching hospital. Cost of the project to the state would be between $90-$95 million. There would be a federal contribution of some $37.2 million.

• Construct the medical science building but cancel building of the teaching and use existing hospital facilities in Worcester.

The cost could be cut, by following this route, to $104.4 million, with the federal government contributing $29.2 million.

• Cancel the proposed medical school and build a two-year medical school. Short shrift was given this idea in the report, which noted that "its benefits and costs were not developed in enough detail." (Present medical schools lack the room in third and fourth year classes to accept students, one of the prime reasons experts downgrade the proposal.)

• Cancel the proposed medical school and develop the community medical school system. This plan envisages establishment of community schools at Worcester, Springfield, Holyoke and Fall River-New Bedford to open in 1973, 1975 and 1977. Others, the report said, could be established at Lowell-Lawrence, Lynn-Salem, Pittsfield-North Adams, Fitchburg-Leominister and Boston. The basic medical science portion of the program would be taught at the Amherst campus

of the University of Massachusetts—a suggestion, Dean Soutter commented, which "creates a number of difficulties because it raises the site controversy again and puts us back where we started." Each school would cost $10-15 million with another $10-15 million required at Amherst.

(The report noted that a system of community medical schools is being developed at the University of Southern Illinois. The first such medical school in the United States will be established in Springfield, Ill. Students will spend their first year and a half on the university campus and their last two and a half years at Springfield. Clinical work will be done in Springfield hospitals. Dr. White said that practicing Massachusetts physicians have an interest in teaching the Berkshire Medical Education Program now affiliated with Albany Medical College. Twenty-three Pittsfield physicians have been appointed to the faculty of postgraduate medicine at Albany and seven to the undergraduate faculty in basic science and clinical areas.)

• Possible programs of financial aid to the existing medical schools in Boston, Boston University and Tufts have asked the state to consider the possibility of taking part in the financing of expansion plans they have formulated. BU, which admitted 88 students in 1968, would like to raise its first year enrollment to 128 by 1972. Tufts, which admitted 120 in 1968, would like to go to 192 by 1972. Harvard Medical School has not asked state aid.

APPENDIX J

SCOPE OF CONTINUED STUDY—PLANNING AND DEVELOPMENT

A. Study of logistical problems.
   1. Transportation for students and visiting faculty
   2. Housing for students and visiting faculty

B. Communications linkages between University of Virginia and affiliated institutions.
   1. Audiovisual technology
   2. Television
   3. Computers

C. Curriculum study and planning.
   1. Family practice programs
   2. Multiple track curriculum development allowing for variable medical school curriculum and variable time to receive M.D. degrees
   3. Special teaching or research requirements
   4. Allied health professional programs

D. Long-range planning for affiliations.
   1. Variable types of programs
   2. How many, and which, communities
   3. Financing

APPENDIX K

TABLE 7a

CAPITAL CONSTRUCTION COSTS FOR DEVELOPING MEDICAL SCHOOLS MAKING LITTLE USE OF EXISTING FACILITIES (GROUP I)

	Basic Science Facilities						Clinical Facilities							
Code No.	No. of Students	Cost of Basic Science Building*	Cost per Student*	Gross Square Feet*	Square Feet per Student	Cost per Square Foot	No. of Volumes*	Hospital Cost*	Cost per Student*	Gross Square Feet*	Cost per Square Foot	Beds	Cost per Bed*	Beds per Student
80	64	$20,400[4]	$320	373	5,840	$55.00	450	.....	....	...	.....	...	...	...
90	64	37,810[3]‡	582	640	10,000	58.20	45	$26,600[4]†	$354	471	$48.00	400	$57	6.3
96	64	9,941[1]	155	174	1,060	57.10	60	15,000[5]†	235	386	38.90*	300	50	4.7
98	64	19,547[3]	302	411	4,750	47.60	40	22,114[4]†	348	427	52.30	350	64	5.5
93	64	7,425[3]	116	200	3,120	37.10	25	23,500[4]†	368	540	43.60	300	73	4.7
94¶	96	15,000[3]	156	311	3,240	48.30	85	21,000[4]†	219	350	60.00	350	60	3.6
60	100	12,000[2]	120	432	4,320	27.80	15	15,500[2]†	155	465	33.40	516	30	5.1
95	100	44,723[5]§	447	697	6,970	63.40	45	33,000[5]	330	544	60.50	400	82	4.0
803	100	21,469[5]†	333	287	2,870	64.50	110	34,763[5]	347	551	.....	400	...	...
802	128	22,150[4]†	174	385	3,000	57.50	75	22,000[5]	172	400	55.00	350	63	2.7
805	150	.....	....	528†	3,510	.....	200	.....	....	500	.....	600	...	4.0
Average	90.4	$21,046	$270	403	4,425	$51.60	105	$23,490	$273	463	$48.90	396	$60	4.5

*Figures are expressed in thousands.
†Projected or planned.
‡Dental School (64-man class) included.
§Major graduate school.
¶There is additional major construction at affiliated hospitals requiring a capital outlay of $27 million.
[1]1964; [2]1965; [3]1966; [4]1967; [5]projected estimate.

TABLE 7b

CAPITAL CONSTRUCTION COSTS FOR DEVELOPING MEDICAL SCHOOLS UTILIZING EXISTING FACILITIES (GROUP II)

	Basic Science Facilities						Clinical Facilities							
Code No.	No. of Students	Cost of Basic Science Building*	Cost per Student*	Gross Square Feet*	Square Feet per Student	Cost per Square Foot	No. of Volumes*	Hospital Cost*	Cost per Student*	Gross Square Feet*	Cost per Square Foot	Beds	Cost per Bed*	Beds per Student
50	48	$ 5,930[2]	$123	172	3,580	$34.70	32	$ 6,000[2]	$125	135	$44.50	100	$60	2.1
92	50	8,505[3]	140	159	2,460	57.00	37	.....	....	....	.....	...	...	...
97	50	6,836[4]	136	142	2,840	48.10	30	.....	....	...	.....	...	...	...
301	100	41,000[5]	410	...	.....	.....	95	22,000[5]	220	...	.....	...	...	...
804	100	9,300[5]	93	170	1,700	55.00	25	13,000[5]	137	250	55.00	...	...	...
Average	69	$14,314	$180	160	2,645	$48.70	44	$14,000	$160	192	$49.70	...	...	...

*Figures are expressed in thousands.
[1]1965; [2]1966; [3]1967; [4]projected estimate.

APPENDIX L

MINIMAL REQUIREMENTS FOR A NEW MEDICAL SCHOOL DATA FROM 1960-1967.

(a) An improved site, the eventual size of which will be not less than 30 acres; (Most have 100 acres)

(b) A heating and air-conditioning plant capable of servicing up to 1,000,000 gross square feet of building space;

(c) A basic science building of not less than 200,000 gross square feet;

(d) A library capable of housing an initial collection of 30,000 volumes and an eventual collection of 100,000 volumes;

(e) An animal care facility of 15,000 gross square feet, preferably in one of the main buildings;

(f) A clinical science building of not less than 100,000 gross square feet;

(g) A hospital unit of 350 to 400 beds with an outpatient department, together totaling approximately 400,000 gross square feet;

(h) A per-square-foot construction cost of $50 to $52;

(i) A total capital investment of $40,000,000;

(j) Initial basic operating expenditures (deficit to be made up from state, university, or other resources) exclusive of grants and contracts of approximately $100,000 for the first year after a dean is appointed, and double each year thereafter for five years, followed by increases to at least $2 million per year;

(k) A period of about four years from the appointment of a dean to the enrollment of the first medical students, the length of the interval determined by the time needed to complete plans, drawings, and construction of buildings.

(From: "Developing Medical Schools: An Interim Report," Smythe, Cheves McC., *The Journal of Medical Education*, Vol. 42, No. 11, page 1003, November, 1967).

APPENDIX M

STATE APPROPRIATIONS FOR SCHOOLS OF MEDICINE 1968-69